What is claimed is:

1.An outer-loop power control device in which a reference signal-to-interference power ratio, which is the basis of transmission power control by a communications environment, is variable, comprising:

a signal-to-interference power ratio measurement unit measuring a signal-to-interference power ratio of a receiving signal;

an error rate measurement unit measuring an error rate of receiving data;

a reference signal-to-interference power ratio modification unit setting an observation time period of an error rate/number of target observation blocks of an error rate, a unit increment of a reference signal -to-interference power ratio, a unit decrement of a reference signal-to-interference power ratio and a target signal error rate in such a way to satisfy a prescribed relation equation and modifying the reference signal-to-interference power ratio, based on the measured error rate; and

a command generation unit generating a command for transmission power control by comparing the modified reference signal-to-interference power ratio with the measured interference power ratio.

2. The outer-loop power control device according to claim 1, wherein

if the target signal error rate, the observation time period, the unit increment, and the unit decrement are assumed to be BLER, T, Sinc, and Sdec, respectively, the relation equation can be expressed as follows.

$$\{1-(1-BLER)^{T}\} \times Sinc = (1-BLER)^{T} \times Sdec$$

3. The outer-loop power control device according to claim 1, wherein

if a plurality of pieces of data are multiplexed in one physical frame and if the number of multiplexed data, the target signal error rate of the data number, the observation time period, the unit increment, and the unit decrement are assumed to be i, $BLER_i$, T, Sinc, and Sdec, respectively, the relation equation can be expressed as follows.

$$[1-\{\prod_{i}(1-BLERi)\}^{T}]\times Sinc = \{\prod_{i}(1-BLERi)\}^{T}\times Sdec$$

4. The outer-loop power control device according to claim 1, wherein

if a plurality of pieces of data are multiplexed

in one physical frame, if each piece of multiplexed data has a different number of blocks per unit time period N_i, and if the number of multiplexed data, the target signal error rate of the data number, the observation time period, the unit increment, and the unit decrement are assumed to be i, $BLER_i$, T, Sinc, and Sdec, respectively, the relation equation can be expressed as follows.

$$[1-\{\prod_i (1-BLERi)^{Ni}\}^T] \times Sinc = \{\prod_i (1-BLERi)^{Ni}\}^T \times Sdec$$

5. The outer-loop power control device according to claim 1, wherein

if a plurality of pieces of data are multiplexed in one physical frame and if the amount of multiplexed data, where the target signal error rate of the data number, the observation time period, the unit increment corresponding to the data number, and the unit decrement corresponding to the data number are assumed to be i, $BLER_i$, T_i, $Sinc_i$, and $Sdec_i$, respectively, the relation equation can be expressed as follows.

$$\{1-(1-BLER_i)^{Ti}\} \times Sinc_i$$
$$= (1- BLER_i)^{Ti} \times Sdec_i$$

6. The outer-loop power control device according to

claim 1, wherein

if a plurality of pieces of data are multiplexed in one physical frame, if each piece of multiplexed data has a different number of blocks per unit time period N_i, and if the amount of multiplexed data, where the target signal error rate of the data number, the observation time period, the unit increment corresponding to the data number, and the unit decrement corresponding to the data number are assumed to be i, $BLER_i$, T_i, $Sinc_i$, and $Sdec_i$, respectively, the relation equation can be expressed as follows.

$$\{1-(1-BLER_i)^{Ni \times Ti}\} \times Sinc_i$$
$$= (1- BLER_i)^{Ni \times Ti} \times Sdec_i$$

7. The outer-loop power control device according to claim 1, wherein

if data blocks are irregularly transmitted /received, if each observation time period has a different number of transmitted/received data blocks, and if the number of data blocks observed during the observation time period, the target signal error rate, the unit increment, and the unit decrement are assumed to be B, BLER, Sinc, and Sdec, respectively, the relation equation can be expressed as follows.

$$\{1-(1-BLER)^{B}\} \times Sinc$$

$$= (1\text{-BLER})^{B} \times \text{Sdec}$$

8. The outer-loop power control device according to claim 1, wherein

if data blocks are irregularly transmitted /received, if each observation time period has a different number of transmitted/received data blocks, and if the amount of multiplexed data, the target signal error rate of the data number, the number of data blocks of the received data number, the unit increment and the unit decrement are assumed to be i, $BLER_i$, B_i, Sinc, and Sdec, respectively, the relation equation can be expressed as follows.

$$[1-\prod_{i}(1-\text{BLERi})^{Bi}]\times \text{Sinc} = \prod_{i}(1-\text{BLERi})^{Bi} \times \text{Sdec}$$

9. The outer-loop power control device according to claim 1, wherein

if a plurality of pieces of data are multiplexed in one physical frame, if data blocks are irregularly transmitted/received, if each observation time period has a different number of transmitted/received data blocks, and if the amount of multiplexed data, the target signal error rate of the data number, the number of data blocks of the received data number, the unit increment

corresponding to the data number and the unit decrement corresponding to the data number are assumed to be i, $BLER_i$, B_i, $Sinc_i$, and $Sdec_i$, respectively, the relation equation can be expressed as follows.

$$[1-(1-BLER_i)^{Bi}] \times Sinc_i$$
$$= (1- BLER_i)^{Bi} \times Sdec_i$$

10.The outer-loop power control device according to claim 1, wherein

in an initial state of communications, a reference signal-to-interference power ratio can be modified by a larger unit amount than a unit modification amount of a reference signal-to-interference power ratio in a stable state before a prescribed number of times of data error are observed.

11. The outer-loop power control device according to claim 1, wherein

the observation time period of an error rate/number of target observation blocks of an error rate, unit increment of a reference signal-to -interference power ratio and unit decrement of a reference signal-to-interference power ratio that satisfy the relation equation are constituted into a table excluding at most one item of the items and using

a target signal error rate as a key, and the observation time period/number of target observation, unit increment and unit decrement can be obtained by referring to the table.

12. An outer-loop power control method in which a reference signal-to-interference power ratio, which is the basis of transmission power control by a communications environment, is variable, comprising:

measuring a signal-to-interference power ratio of a receiving signal;

measuring an error rate of receiving data;

setting an observation time period of an error rate/number of target observation blocks of an error rate, a unit increment of a reference signal-to -interference power ratio, a unit decrement of a reference signal-to-interference power ratio and a target signal error rate in such a way to satisfy a prescribed relation equation and modifying the reference signal-to-interference power ratio, based on the measured error rate; and

generating a command for power transmission control by comparing the modified reference signal-to -interference power ratio with the measured interference power ratio.

13. An outer-loop power control device in which a reference signal-to-interference power ratio, which is the basis of transmission power control by a communications environment, is variable, comprising:

a signal-to-interference power ratio measurement unit measuring a signal to interference power ratio of a receiving signal;

a reference signal-to-interference power ratio modification unit varying the reference signal-to-interference power ratio based on measurement result of an error rate in a measurement time period of the error rate and changing the reference signal-to-interference power ratio to a large value without waiting for an end of the measurement time period when an error of a signal is detected in the measurement time period; and

a command generation unit generating a command signal for transmission power control by comparing the modified reference signal-to-interference power ratio with the measured interference power ratio.